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A PLAN FOR FOREST INSECT SURVEY ACTIV ITIES UNDER THE FOREST PEST CONTROL ACT

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INTRODUCTION

This plan has been prepared as a basis for establishing an adequate program for carrying on forest insect surveys, for giving technical assistance and advice in conducting control operations, and for preparing technical reports by the various Divisional field stations. It is a fact, long recognized, that infestations must be detected prior to outbreak conditions if control be carried out effectively and economically. This can best be done through surveys conducted systematically on an area wide basis under the supervision of well trained men. Although surveys have been carried on for nearly 50 years the need for more effective detection and better protection resulted in the passage in 1947 by the 80th Congress of enabling legislation known as Public Law 110 - the Forest Pest Control Act. This Act, which is attached in the form of appendix D to this Plan, authorizes the Secretary of Agriculture, either directly or in cooperation with Federal, state, and private forestry agencies and landowners, "to conduct surveys on any forest lands to detect and appraise infestations of forest insect pests and tree diseases, to determine the measures which should be applied on such lands, in order to prevent, retard, control, suppress, or eradicate incipient, threatening, potential, or emergency outbreaks of such insect or disease pests, and to plan, organize, direct, and carry out such measures as he may deem necessary to accomplish the objectives and purposes of this Act:...."

RESPONSIBILITIES OF THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Coordinating the forest insect surveys and advising with reference to control under provisions of the Forest Pest Act are responsibilities of the Bureau of Entomology and Plant Quarantine. This can best be achieved by a coordinated program, national in scope, which will adequately meet the survey and control needs of the regions served by the field stations of the Division of Forest Insect Investigations. These needs will be based upon (1) timber growing, recreational, watershed, and other forest values; (2) the susceptibility of the forests to attack by native or introduced forest insect pests; (3) the availability of effective control methods, and (4) the

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expressed willingness of public and private forest-managing agencies to control insect outbreaks that seriously threaten to damage or destroy the forest resources.

Essentially the responsibilities of the Bureau under the provisions of the Act are to carry on surveys, determine the entomological soundness of control, and to furnish public and private forest owners and managers with technical assistance in organizing control programs. In the case of control projects financed wholly or in part by Forest Pest Control Act funds, this advice and assistance is obligatory. The field stations can do much to acquaint these owners and managers with the service that is available to them. Assistance, by the Bureau, in the case of State and private control programs, will be greatly facilitated in the various states by legislation enabling them to participate in cooperative programs under the Act.

In order to carry out this program, to the best advantage of all concerned a plan for conducting surveys, determining the need for control, and giving technical assistance and advice in actual control operations has been prepared following discussions at Divisional survey schools held at Fort Collins, Colo. and New Haven, Conn., early in 1951. This plan is herewith presented in detail. While it is intended primarily for use by the Divisional personnel, it may also be found useful to co-operators. The end product of the plan will be the technical reports from the respective field stations, summarizing all available information regarding each situation in each region and serving as a basis for an equitable allocation of survey funds under the Forest Pest Control Act.

RESPONSIBILITIES AND ACTIVITIES OF THE DIVISIONAL FIELD STATIONS

Forest Insect Surveys

Three distinct types of forest insect surveys are recognized as coming within authority contained in the Forest Pest Act. They are (1) detection, (2) reconnaissance, and (3) appraisal. They will ordinarily constitute the normal survey activities of each field station. Area hazard and damage surveys will be conducted when and where possible to provide information on the susceptibility of forested areas to insect attack, to determine trends of infestation, and to determine cumulative loss from insect attack.

Surveys will normally be conducted in areas for which some forest insect protection plan is in force or can be developed.

The field stations should encourage the assistance of agencies or individuals in the survey program. When this has been secured, the field stations will suggest the standards and procedures of field work and will act as a clearing house to assemble, evaluate, and report the information obtained from all sources.

Types of Survey

1. Detection Survey

This type of survey consists of the observation and reporting of insect infestations in forested areas or forest plantations. It may be done by anyone, any time, anywhere. In actual practice the type of information required of this survey may be obtained without the formality of a planned survey at all. When an insect infestation in a forest or forest plantation has been observed and reported the requirements of a detection survey have been met.

a. Purpose. - To reveal the presence of harmful or potentially harmful infestations of forest insects prior to their development to outbreak proportions.

b. Where made. - In broad terms, detection surveys may be made in any stand or forest plantation. In the case of planned surveys they will be made only in stands or plantations where current information on insect activity does not exist.

c. How made. - This type of survey may be made in a great number of ways, depending on the observer and the conditions surrounding the moment of his observation of insect activity. However, when it is the result of a plan it usually will be made by personnel of the survey organization or cooperating agencies walking through a stand or plantation and examining individual trees, or by flying over them and looking for signs of insect activity from the air.

d. Use of information obtained. - In the case of planned detection surveys the data will tell when insects are present and when they are absent. Observations made by individuals while not specifically involved in such surveys will tell of the presence of insects in specific localities. They may not indicate their absence in any other locality. Reconnaissance surveys are planned on the basis of detection survey reports.

2. Reconnaissance Survey

A survey of a known infestation conducted by technical personnel of the survey organization, or by adequately trained personnel of cooperating agencies working under supervision of field station technical personnel.

a. Purpose. - To provide information on the extent of a known infestation and its exact location. The insect species, the species of tree infested, the amount of injury being done, and the trend of the infestation are determined.

b. Where made. - In areas where the forest or plantation resources at stake are considered valuable enough to warrant protection from insect injury.

c. How made. - By close examination of infested areas. Methods will vary according to the insect species involved and the size of the infested area. In some cases, as with certain bark beetles, it is usually done entirely from the ground. In others, as with certain defoliators, it may be done largely from the air.

d. Use of information obtained. - Reconnaissance survey data are used to determine the current and/or potential danger of an infestation. They are used as bases for decisions as to the desirability of control.

3. Appraisal Survey

A systematic sampling of an infestation pre-determined in a reconnaissance survey to be of such character as to warrant control; also the systematic sampling of a stand after completion of a control program. Conducted by technical personnel of the survey organization, or by adequately trained personnel of cooperating agencies working under supervision of field station technical personnel.

a. Purpose. - To collect detailed information in a heavily infested area for use in planning a control program; also to collect equally detailed information on the efficacy of a control program after its completion.

b. Where made. - In stands so heavily infested as to endanger the resources at stake, or in stands where control programs have been conducted.

c. How made. - Methods of survey will vary, depending on the insect species involved and the character of the stand and the terrain. In one instance, an actual count of infested trees on a pre-determined proportion of the infested area may be required; in another, requirements may be met by recording the acreage of infestation. In all cases this type of survey is made so intensively that a full knowledge of the requirements of a control program or an accurate record of the efficacy of a control program is provided.

d. Use of information obtained. - On the basis of appraisal survey data collected in an infested area a control program can be planned, item by item, with the land-managing agency involved. For example, the gallonage of insecticide needed is made known; also the number of men required for the job, the period of control operations, the type and quantity of control equipment, and the approximate cost. Data obtained in an appraisal of the efficacy of a control program can be used to determine the advisability of follow-up control work.

4. Area Hazard Survey

This is a survey of forested areas to determine their susceptibility to insect attack. The presence or absence of insect infestations at the time of survey is immaterial. Hazard surveys normally will be conducted by technical personnel of the survey organization, but also at times may be made cooperatively with Federal, state, or private agencies.

a. Purpose. - To determine the relative susceptibility of forest stands and/or areas to insect injury in order that they may be classified according to degree of hazard.

b. Where made. - In stands or areas where possibilities exist for successful control or prevention of insect outbreaks through forest management practices.

c. How made. - By intensively sampling forest stands or areas. Methods to use will be governed by the life history, habits, environmental requirements, etc. of the particular insect species for which preventive control measures are contemplated.

d. Use of information obtained. - Stands and forested areas will be classified according to degree of hazard. Land-owning and land-managing agencies will be furnished with this information for use in the modification or initiation of management practices designed to alleviate the hazard.

5. Damage Survey

A survey made periodically in given areas to determine loss due to insect activity and to accumulate information on infestation trends. To be made by technical personnel of the survey organization and by adequately trained cooperators.

a. Purpose. - To determine loss from insect activity, to correlate this loss with timber resource values, and to determine fluctuations in infestations.

b. Where made. - In plots randomly distributed among typical forested stands without regard to the occurrence at any one time of insect infestations.

c. How made. - By determining at regular intervals, usually per year, the extent of tree mortality due to insect activity.

d. Use of information obtained. - Data obtained in this type survey will be utilized to indicate at any given time the status of injury to timber resources by insect pests. It will answer the question as to the effect of insects on these resources during periods of endemic populations as well as during outbreaks.

Remarks. - Information obtained in these surveys is of value to the Forest Service since insect losses comprise an important part of timber drain. It will also provide a means for determining the status of infestations at any given time.

Technical Advice on Insect Control

The following is an outline of the technical advice and assistance on insect control rendered by the Division of Forest Insect Investigations through its field stations.

1. Determination of the entomological soundness of applied control on the basis of the survey information.

2. Delineation of areas to be treated, including maps showing such things as drainage, culture, land subdivision, host types when available, often the survey strip or plot samples showing the distribution of trees or areas to be treated, possible sites for control camps, and nature of land ownerships.

3. Estimates of the number and/ or volume of infested trees or the boundaries of areas to be treated, by total project area and major subdivisions.

4. Description of recommended control techniques, including methods and timing.

5. Suggested control organization and cost estimates.

6. Assistance in training control personnel.

7. Checking of treating procedures and measuring of the resultant insect mortality.

8. Reporting upon technical phases of completed projects.

Technical Reports

Forest Insect Surveys

Reports will be prepared following all planned surveys. In addition specialized reports may be prepared from area hazard and timber drain surveys. Reports of reconnaissance and appraisal surveys will be uniform in content in order that they may be comparable between regions, and that they may provide the information needed at the Division level for the evaluation of forest insect conditions throughout the country.

In Appendices A and B attached to this outline are suggestions for standardizing survey report titles and certain tabular information.

Insect Control Projects

The results of a control project will be reported not only for the files, but to assist future control planning. Since the forest-managing agency responsible for the control work submits a progress report covering project organization, costs, and accomplishments, the Divisional report, made by the field station will be confined to the technical phases only.

SUGGESTED FORMS FOR TITLES OF FOREST INSECT SURVEY REPORTS

To describe the type of survey used, to facilitate filing, and to foster uniformity of practice among the field stations, the following forms will be used in the titles of survey reports.

1. Where more than one insect species is encountered:

FOREST INSECT CONDITIONS or SURVEY
(Name of Area, Forest or Park)
(Date: Month or Season, Year)
(Subtitle: Type of Survey)

Examples: A

FOREST INSECT CONDITIONS
Ochoco National Forest, Oregon
Spring, 1950
(DETECTION, RECONNAISSANCE OR APPRAISAL) SURVEY

B.

FOREST INSECT SURVEY
Nicolet National Forest, Wisconsin
July-August, 1950
Sawfly and Spittlebug Damage in
Pine Plantations on the Nicolet National Forest
RECONNAISSANCE SURVEY

2. Where only one insect species is encountered:

INSECT SPECIES
(Name of Area, Forest or Park)
(Date: Month or Season, Year)
(Subtitle: Type of Survey)

Examples: A.

MOUNTAIN PINE BEETLE
Clearwater National Forest, Idaho
October, 1950
RECONNAISSANCE (OR APPRAISAL) SURVEY

B. THE SPRUCE BUDWORM IN MAINE IN 1950
WITH SPECIAL REFERENCE TO SURVEYS
June-July, 1950
RECONNAISSANCE SURVEY

INSTRUCTIONS FOR PREPARING ABSTRACT OF FOREST INSECT SURVEY

Type of Survey: Abstract only for reconnaissance or appraisal surveys.

Survey area: National Forest, National Park, Indian Reservation, etc.

Date: When survey report was made.

Project area: Name of project.

Insect spp: Common name and scientific name.

Host spp: Common name and scientific name.

Status of infestation: Whether incipient or endemic; epidemic of long standing or new; increasing or decreasing; outbreak resulting from blow-down etc.

Scope of infestation: Size of area in net timbered acres, total number of trees, and the total board measure if applicable.

Acreage of defoliation: Size of area in net timbered acres.

Ownership: Total acres of indicated ownership.

Stand status: Virgin or cutover; if cutover, percent of stand cut.

Timber resource value: Indicate value of resource which might ultimately be destroyed or lost if control is not undertaken (current). Indicate approximate value of current loss, both raw and manufactured. (Past_____yr. cumulative) include same as (current) above. Any period of years to be included, up to 10, where reliable information is available. (Ultimate loss, if no control.)

Industry dependence: Note the dependence of industry on resources of timber etc. threatened or being killed. Include number of sawmills; pole plants; value of annual output; annual payroll of employees; recreational value, where applicable, such as number of summer homes, hotels, community developments, number of picnickers or campers annually, etc.

Control method recommended: Include nature of control, such as aerial spraying, toxic sprays to standing trees, toxic sprays to felled trees, fell-peel-burn, solar heat, sanitation-salvage, etc. If no control is recommended tell why it is not necessary.

Estimated control costs: Estimate number of man-days required for control operation; also cost in monetary figures.

Duration and time of control operation: Indicate optimum time for start of operation and latest completion date.

Reduction of infestation expected by control: Indicate expected reduction of infestation through control.

Period of control benefits expected without additional control action: Indicate whether single control operation is needed, or whether maintenance control will be required.

Depending on the type of land ownership, five or more copies of this abstract should be made for, (1) the divisional survey leader, (2) the field station, (3) the regional office of the land-managing or land-owning agency (Federal, state or private), (4) the local office of the land-managing or land-owning agency (Federal, state or private), (5) the Washington Office, if this is the land-managing agency (Forest Service, National Park Service, etc.). If more than one Federal agency is involved the appropriate number of extra copies should be prepared and forwarded. The Washington copies should be mailed to the office of the Division of Forest Insect Investigations, Beltsville, Md., for distribution.

ABSTRACT OF FOREST INSECT SURVEY

Type of survey: _____ Field Station Reporting: _____

Survey area: _____ Date: _____

Project area: _____ State: _____ Co.: _____

Insect spp.: _____

Host spp.: _____

Status of infestation: _____

_____

Scope of infestation: _____ : _____ : _____ : _____

(Total Ac.) (Total Tr.) (Total b.m.) (Trees/ Ac.) (b.m./ Ac.)

Acreage of defoliation: _____ : _____ : _____ : _____

(Heavy) (Medium) (Light) (Total)

Ownership (Acres): _____ : _____ : _____ : _____

(Federal) (Private) (State) (Other)

Stand status: _____

Timber resource value: (Current killing) _____

_____

Past ____ yr. cumulative: _____

_____

Ultimate loss, if no control: _____

_____

Industry dependence: _____

_____

Control method recommended: _____

_____

Estimated control costs: _____ : _____ : _____ : _____

(Total) (Per Tr.) (Per Ac.) (Per b.m.)

Duration and time of control operation: _____

_____

_____

Reduction of infestation expected by control: _____

_____

_____

Period of control benefits expected without additional control action: _____

_____

_____

Agency expected to perform control operation: _____

_____

_____

Remarks: _____

_____

_____

_____

Prepare FIVE copies of this form.

DETECTION SURVEY INFORMATION FROM COOPERATORS

The success of the detection survey program will depend to a great extent upon the information on insect outbreaks forwarded to the Divisional field stations by cooperators. The task of obtaining and recording this information in the field will be greatly facilitated by the use of a field form for reporting. Such a form might be entitled "Field Report of Insect Damage," and should be of a size that will fit into field notebooks, permitting a supply to be carried at all times while in the field. Until a standard form is approved it is recommended that each station prepare one suitable for the needs in that region.

The form should provide for the following information.

1. Observation Data
   - Date
   - Observer's name, title, and affiliation
   - Location: Land subdivision; local name of area; Forest, Park, County, and State, ranger district.

2. Tree Damage Symptoms
   - Crown discoloration: color phase; extent of discoloration
   - Needle or leaf damage - percent defoliation
   - Twig or limb damage
   - Cone damage
   - Bole damage
   - Root damage

3. Infestation Characteristics
   - Age, size, and number of infested trees
   - Occurrence of infested trees: single or in groups (if in groups, how many per group)
   - Area of infestation: acres, description of
   - Status: number of infested trees increased or decreased over previous year
   - Number of years active

4. Conditions Associated with Current Infestation
   - Weather abnormalities
   - Fire
   - Logging
   - Other Insect Infestations
   - Man-caused forest disturbances

5. Insect Responsible for Infestation (if possible to determine)

6. Accessibility

7. Remarks

(PUBLIC LAW 110 -- 80th CONGRESS)
(CHAPTER 141 -- 1st SESSION)
(S. 597)

AN ACT

To provide for the protection of forests against destructive insects and diseases, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to protect and preserve forest resources of the United States from ravages of bark beetles, defoliators, blights, wilts, and other destructive forest insect pests and diseases, and thereby enhance the growth and maintenance of forests, promote the stability of forest-using industries and employment associated therewith, aid in fire control by reducing the menace created by dying and dead trees injured or killed by insects or disease, conserve forest cover on watersheds, and protect recreational and other values of forests, it shall be the policy of the Government of the United States independently and through cooperation with the Governments of States, Territories, and possessions, and private timber owners to prevent, retard, control, suppress, or eradicate incipient, potential, or emergency outbreaks of destructive insects and diseases on, or threatening, all forest lands irrespective of ownership.

SEC. 2. The Secretary of Agriculture is authorized either directly or in cooperation with other departments of the Federal Government, with any State, Territory, or possession, organization, person, or public agency, subject to such conditions as he may deem necessary and using such funds as have been, or may hereafter be, made available for these purposes, to conduct surveys on any forest lands to detect and appraise infestations of forest insect pests and tree diseases, to determine the measures which should be applied on such lands, in order to prevent, retard, control, suppress, or eradicate incipient, threatening, potential, or emergency outbreaks of such insect or disease pests, and to plan, organize, direct, and carry out such measures as he may deem necessary to accomplish the objectives and purposes of this Act: Provided, That any operations planned to prevent, retard, control, or suppress insects or diseases on forest lands owned, controlled, or managed by other agencies of the Federal Government shall be conducted with the consent of the agency having jurisdiction over such lands.

SEC. 3. The Secretary of Agriculture may, in his discretion and out of any money made available pursuant to this Act, make allocations to Federal agencies having jurisdiction over lands held or owned by the United States in such amounts as he may deem necessary to retard, control, suppress, or eradicate injurious insect pests or plant diseases affecting forests on said lands.

SEC. 4. No money appropriated to carry out the purposes of this Act shall be expended to prevent, retard, control, or suppress insect or disease pests on forest lands owned by persons, associations, corporations, States, Territories, possessions, or subdivisions thereof until such contributions toward the work as the Secretary may require have been made or agreed upon in the form of funds, services, materials, or otherwise.

SEC. 5. There are hereby authorized to be appropriated for the purposes of this Act such sums as the Congress may from time to time determine to be necessary. Any sums so appropriated shall be available for necessary expenses, including the employment of persons and means in the District of Columbia and elsewhere, printing and binding, and the purchase, maintenance, operation, and exchange of passenger-carrying vehicles; but such sums shall not be used to pay the cost or value of any property injured or destroyed. Materials and equipment necessary to control, suppress, or eradicate infestations of forest insects or tree diseases may be procured without regard to the provisions of section 3709 of the Revised Statutes (41 U.S.C. 5) under such procedures as may be prescribed by the Secretary of Agriculture, when deemed necessary in the public interest.

SEC. 6. The provisions of this Act are intended to supplement, and shall not be construed as limiting or repealing, existing legislation.

SEC. 7. This Act may be cited as the "Forest Pest Control Act."

Approved June 25, 1947.